

**UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF TEXAS  
AUSTIN DIVISION**

KLA-TENCOR CORPORATION,  
Individually and d/b/a KLA-TENCOR,  
INC. a Delaware Corporation  
Plaintiff

v.

XITRONIX CORPORATION,  
a Delaware Corporation  
Defendant

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Civil Case No. A:08-cv-723-SS

Demand for Jury Trial

**PLAINTIFF KLA-TENCOR'S TRIAL BRIEF**

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Plaintiff KLA-Tencor Corporation (“KLA-Tencor”) respectfully submits this trial brief setting forth issues expected to arise at trial.

## **I. DECIDED ISSUES**

### **A. Claim Construction**

This Court construed the following language found in the claims of KLA-Tencor’s U.S. Patent No. 7,362,441 (“the ‘441 Patent”). (*See* Docket Entry 48, (“DE 48”).)

**“Pump beam”** means a laser output used to excited a sample.

**“Thermal wave”** means a disturbance in the form of a change in heat.

**“Plasma wave”** means a disturbance in the form of a change in carrier density.

**“Probe beam”** means a laser output used to measure reflectance.

**“Intensity modulated”** means a time-dependent variation in magnitude.

**“Periodically excite”** means to excite at regular intervals.

**“Implantation dose”** means ions per unit area.

**“Modulated optical reflectivity”** means changes in the light reflectivity of the sample resulting from changes in the power of the pump beam when directed toward the sample.

**“Modulated changes in the reflected probe beam”** means changes in the power of the reflected probe beam resulting from changes in the reflectivity of the sample.

**“Monitoring the modulated changes”** means monitoring the changes in the power of the reflected probe beam.

**“Junction depth”** means the depth at which the junction between the implanted and nonimplanted regions is located.

The Court declined to construe the phrase “[wavelength of the probe beam that is] selected to substantially maximize the strength of the output signals corresponding to the modulated optical reflectivity” and instructed that it and all other claims terms be given their ordinary meaning as understood by a Person of Ordinary Skill in the Art. (DE 48 at 11.)

**B. Inequitable Conduct**

The Court granted KLA-Tencor's motion for a partial summary judgment of no inequitable conduct. (DE 162 at 24.) Thus, the '441 patent and U.S. Patent No. 7,126,690 are not unenforceable for inequitable conduct.

**II. ISSUES TO BE DECIDED**

**A. Infringement**

- Whether Xitronix Corporation ("Xitronix") literally infringed any of claims 7, 9, 11, and 12 of the '441 Patent ("the Asserted Claims").
- Whether Xitronix infringed any of the Asserted Claims under the doctrine of equivalents.
- Whether Xitronix induced infringement of any of the Asserted Claims.
- Whether Xitronix contributed to the infringement of any of the Asserted Claims.

**B. Willful Infringement**

- Whether Xitronix's infringement was willful.

**C. Validity**

- Whether any of the Asserted Claims are invalid as anticipated by the prior art under 35 U.S.C. § 102.
- Whether any of the Asserted Claims are invalid for obviousness under 35 U.S.C. § 103.
- Whether any of the Asserted Claims are invalid because the specification of the '441 Patent lacks written description to support that claim under 35 U.S.C. § 112.
- Whether Claim 7 of the '441 Patent is invalid for indefiniteness.

### III. INFRINGEMENT

#### A. Legal Standard for Infringement

A determination of patent infringement consists of two steps: (1) the court must first interpret the claim, and (2) it must then compare the properly construed claims to the allegedly infringing device. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc). Claim construction, the first step, is a matter of law. *Id.* at 1456. The Court construed the disputed terms of the ‘441 Patent on September 1, 2009. (DE 48.) Generally, the second step – comparing the construed claims to the accused device – is a factual question. *Bai v. L & L Wings, Inc.*, 160 F.3d 1350, 1353 (Fed. Cir. 1998). The accused device may infringe in one of two ways, either literally or via the doctrine of equivalents. *Allen Eng'g Corp. v. Bartell Indus.*, 299 F.3d 1336, 1345 (Fed. Cir. 2002). The accused device literally infringes if each and every claim limitation reads on the accused device. *Id.* at 1345. Even if the accused device does not literally infringe a claim it may still infringe under the doctrine of equivalents “if there is ‘equivalence’ between the elements of the accused product or process and the claimed elements of the patented invention.” *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997) (citing *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950)).

#### B. Xitronix Admits It Practices All the Claim Elements Except One

Xitronix has admitted through its expert, Dr. Current’s reports, and its responses to KLA-Tencor’s requests for admission that it practices all the claim elements except one. The sole remaining issue relating to Xitronix’s infringement of the ‘441 Patent is whether the XP450 and XP700 (“the Accused Devices”) meet the claim limitation “wherein the wavelength of the probe beam ... is selected to substantially maximize the strength of the output signals” from claims 7 and 9 of the ‘441 Patent (“the probe wavelength selection limitation”).



Xitronix admits that the XP450 it assembled in the United States was a Therma-Probe TP-420, modified by replacing the probe laser with a fixed 373 nm wavelength probe laser. The Therma-Probe TP-420 device includes each of the claim elements of the Asserted Claims except the probe wavelength selection limitation and was specifically engineered to generate both plasma and thermal waves.

**C. Xitronix's Accused Devices Include a Probe Beam Wherein the Wavelength "is Selected to Substantially Maximize the Strength of the Output Signals"**

At least Xitronix documents and the testimony of KLA-Tencor's expert Dr. Aspnes will establish that the wavelength of the Accused Devices was selected to substantially maximize the strength of the output signals. Specifically, in its own description of the Accused Devices, Xitronix has pointed out that the increased amplitude of the PR signal (the modulated optical reflectivity response) is two orders of magnitude larger than the PR signals achieved in other implant monitoring systems. Xitronix documents depict a graph with a maximum response at or near the 373-375 nm wavelength selected for the Accused Devices. Xitronix has also stated that the probe wavelength for the XP450 device was specifically selected to maximize the PMPR (output) signal. This evidence, along with Dr. Aspnes' independent calculations of the output signal, establishes that Xitronix chose the wavelength for its Accused Devices to substantially maximize the output signal.

#### IV. WILLFUL INFRINGEMENT

KLA-Tencor will prove at trial that Xitronix's infringement of the Asserted Claims was willful.

##### A. Legal Standard for Willful Infringement

KLA-Tencor has alleged that Xitronix willfully infringed the '441 Patent, and must prove willful infringement by clear and convincing evidence. *In re Seagate*, 497 F.3d 1360, 1371 (Fed. Cir. 2007). Recently, in *Seagate*, the Federal Circuit changed the standard for willful infringement from an affirmative duty of due care by the accused infringer to a two-part test:

1. A patentee must show by clear and convincing evidence that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid patent.... *The state of mind of the accused infringer is not relevant to this objective inquiry.*
2. If this threshold objective standard is satisfied, the patentee must also demonstrate that this objectively-defined risk (determined by the record developed in the infringement proceeding) was either known or so obvious that it should have been known to the accused infringer.

*Id.* at 1371 (citations omitted). The willfulness inquiry is one of fact and "is determined from the totality of the circumstances." *ACCO Brands, Inc. v. ABA Locks Mfrs.*, 501 F.3d 1307, 1312 (Fed. Cir. 2007) (decided post-*Seagate*).

In *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 827 (Fed. Cir. 1992), the Federal Circuit identified the following factors as relevant to the "totality of the circumstances":

1. whether the infringer deliberately copied the ideas or design of another,
2. whether the infringer, when he knew of the other's patent protection, investigated the scope of the patent and formed a good faith belief that it was invalid or not infringed,
3. the infringer's behavior as a party to the litigation,
4. the accused infringer's size and financial condition,

5. closeness of the case,
6. duration of the accused infringer's misconduct,
7. remedial action by the accused infringer,
8. the accused infringer's motivation for harm, and
9. whether the accused infringer attempted to conceal its misconduct.

Moreover, it is appropriate to inquire into "standards of commerce" when evaluating willful infringement. *Seagate*, 497 F.3d at 1371 n.5. Thus, while the standard is objective, all circumstances attendant to Xitronix's conduct must be considered.

**B. There is Strong Evidence Suggesting That Xitronix Willfully Infringed the '441 Patent**

*1. Xitronix Continued to Test and Market All of Its Infringing Products Despite Knowledge of the '441 Patent*

It is undisputed that Xitronix knew of the '441 Patent at least as early as July 25, 2008. Xitronix was also aware that the '441 Patent covered a modulated optical reflectivity metrology apparatus with a UV probe and a method of use for that apparatus. Despite this knowledge, Xitronix continued to use and market its infringing products.

*2. At The Time Xitronix Chose to Infringe the '441 Patent, It Could Not Have Had a Reasonable Belief that the XP 450 and XP 750 did not infringe the '441 Patent*

Xitronix has confirmed that it never obtained a written opinion from counsel regarding infringement of the '441 Patent or its validity. While *Seagate* eliminated the "affirmative obligation to obtain opinion of counsel," the jury and this Court may still "consider whether a defendant obtained advice of counsel as part of the totality of the circumstances in determining willfulness." *Seagate*, 497 F.3d at 1371. Accordingly, this serves as evidence that Xitronix did not have a reasonable belief that it did not infringe the '441 Patent.

## V. VALIDITY

Patents are presumed valid. 35 U.S.C. § 282. As the accused infringer, it is Xitronix's burden to prove, by clear and convincing evidence, that the '441 Patent is invalid. *Minn. Mining and Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 1303 (Fed. Cir. 2002).

### A. The Asserted Claims of the '441 Patent are Not Invalid for Anticipation

#### 1. Legal Standard for Anticipation

Under 35 U.S.C. § 102, a patent is invalid as anticipated if the claimed invention was “described in a printed publication in this or a foreign country” before the date of invention or more than one year before the application date. 35 U.S.C. § 102(a)-(b); *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008). An anticipating publication must describe each and every limitation of the claim within that single prior art reference. *Crown Operations Int'l, LTD v. Solutia Inc.*, 289 F.3d 1367, 1375 (Fed. Cir. 2002). Moreover, it must “describe the patented subject matter with sufficient clarity and detail to establish that the subject matter existed in the prior art and that such existence would be recognized by persons of ordinary skill in the field of the invention.” *Id.*

#### 2. Xitronix Lacks Sufficient Evidence to Meet Its Burden for Proving Anticipation

Xitronix contends that the Asserted Claims are invalid as anticipated by Mansanares<sup>1</sup> and Batista.<sup>2</sup> However, these references do not anticipate the asserted claims because they do not describe each and every limitation in the Asserted Claims.

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<sup>1</sup> A.M. Mansanares, *Optical Detection of Photothermal Phenomena in Operating Electronic Devices: Temperatures and Defect Imaging*, in PROGRESS IN PHOTOTHERMAL AND PHOTOACOUSTIC SCIENCE AND TECHNOLOGY: SEMICONDUCTORS AND ELECTRONIC MATERIALS 73 (A. Mandelis and P. Hess eds., 2000) (“Mansanares”).

<sup>2</sup> Jerias A. Batista, et al., *Contrast and sensitivity enhancement in Photothermal Reflectance Microscopy through the use of specific probing wavelengths: application to microelectronics*, ANALYTIC SCIENCE, Vol. 17, pp. s73-s75, April 2001 (“Batista”).

Specifically, Mansanares does not teach selection of a probe wavelength to substantially maximize the strength of the output signals. Where Mansanares discusses choosing an appropriate wavelength for a probe beam, it teaches selection of a wavelength for the purpose of obtaining a high contrast between two different materials such as gold, silicon or polycrystalline silicon thin films. Dr. Aspnes' testimony will establish that the discussion of contrast and selection of wavelength in Mansanares is related to selecting a wavelength for generating contrast between two different materials rather than maximizing output. Importantly, even if Mansanares did teach selection of a wavelength within the claimed range of 355-410 nm it still would not satisfy the claim at issue because such a selection is not made to substantially maximize the output signal.

In addition, Mansanares does not teach an intensity-modulated pump beam in combination with the other elements of the asserted claims. In Mansanares, the optical reflectivity of the sample is modulated by applying a current and not by the use of an intensity-modulated pump beam. To conclude Mansanares teaches an intensity modulated pump beam, Xitronix must go to other sources. The use of these additional references to provide missing elements avoids anticipation.

Similarly, Batista does not anticipate the Asserted Claims because it fails to disclose several elements of the Asserted Claims. Just as with Mansanares, Batista does not teach the selection of a probe wavelength to substantially maximize the strength of the output signals. Also, Batista does not disclose a pump beam in a two laser beam system. Because Batista does not disclose a pump beam, it does not disclose a collinear pump and probe beam. It also cannot disclose the use of a pump beam to generate thermal and plasma waves in the sample.

Moreover, Batista does not ever disclose a detector for detecting the reflected probe beam or a processor for evaluating the output signals from the detector.

**B. The Asserted Claims of the ‘441 Patent Are Not Invalid for Obviousness**

*1. Legal Standard for Obviousness*

A patent is invalid as obvious if “the differences between the subject matter [of the patent] and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a). It is often necessary “to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue” while remembering that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l, Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

*2. Xitronix Lacks Sufficient Evidence to Meet Its Burden for Obviousness*

Xitronix has asserted that several different combinations of prior art references render the Asserted Claims obvious. However, one of the claim limitations of the ‘441 Patent is missing in each of the references cited by Xitronix. None of the references disclose or teach the probe wavelength selection limitation. Without the disclosure of this limitation in any of its cited references, Xitronix cannot establish its claim of obviousness.

Moreover, Xitronix cannot present sufficient evidence of motivation to combine any of the references. On the other hand, Dr. Aspnes’ testimony will establish that Xitronix’s various references would not have been combined by one of skill in the art. Accordingly, Xitronix cannot meet its clear and convincing burden on obviousness.

**C. The Specification of the ‘441 Patent Adequately Describes the Asserted Claims of the ‘441 Patent**

*1. Legal Standard for Written Description*

Pursuant to 35 U.S.C. § 112, a patent can be found invalid if its specification fails to contain “a written description of the invention.” 35 U.S.C. § 112. To meet the written description standard, an applicant “does not have to describe exactly the subject matter claimed” but “the description must clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed.” *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991) (quoting *In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989)).

It is not necessary for the specification to contain the exact words as they are found in the claim limitation. *See Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010) (“the description requirement does not demand ... that the specification recite the claimed invention *in haec verba*”). Rather, all that is required is that one of ordinary skill be able to reasonably discern the claim limitation by reading the specification. *Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1364 (Fed. Cir. 2003); *Crown*, 289 at 1376 (“Put another way, one skilled in the art, reading the original disclosure, must reasonably discern the limitation at issue in the claims.”).

*2. Xitronix Will Fail to Prove Lack of Written Description by Clear and Convincing Evidence*

The claim limitation Xitronix alleges is missing from the specification of the ‘441 Patent – selection of a probe wavelength to substantially maximize the strength of the output signals – is, in fact, adequately described in at least two places in the specification.

The original specification of the ‘441 Patent sufficiently describes the selection of a probe wavelength to substantially maximize the output signal at column 3, lines 11-25:

For one implementation, the probe laser is configured to operate in the 400-405 nm wavelength range. At that spectral range, the difference between the temperature reflectance coefficient and the carrier reflectance coefficient is maximized. This increases the signal measured by the detector when measuring samples with thermally-dominated modulated reflectance signals. For a second implementation, the probe laser operates in the 360 nm wavelength range. At that spectral range, both the temperature and carrier plasma reflectance coefficients have the same (negative) sign leading to a constructive interference between the thermal and carrier plasma wave contributions to the total PMR signal. Once again, this increases the signal measured by the detector when measuring samples with thermally-dominated modulated reflectance signals.

The testimony of KLA-Tencor's expert, Dr. Aspnes, will establish that a person of ordinary skill would read this portion of the specification and know it teaches to select a wavelength to substantially maximize the output signal. In addition, another passage from the specification discloses the selection of small wavelength ranges where the "overall PMR signal" is increased at column 5, line 56 through column 6, line 17:

As shown in FIG. 2,  $dR/dT$  increases dramatically in the near-UV wavelength range 390-410 nm and decreases dramatically in the UV wavelength range around 360 nm. Although not shown,  $dR/dN$  remains practically unchanged over this range of wavelengths. For implementations where probe laser 104 operates at a fixed wavelength, the relationship between the  $dR/dT$  and  $dR/dN$  waveforms results in two desirable operating modes for modulated reflectance measurement system 100. For the first, probe laser 102 operates in the 400-405 nm wavelength range. At that spectral range, the difference between  $dR/dT$  and  $dR/dN$  increases the signal measured by detector 126 by as much as a factor of ten when compared to conventional PMR systems when measuring samples with thermally-dominated modulated reflectance signals.

For the second operating mode of modulated reflectance measurement system 100, probe laser 102 operates in the 360 nm wavelength range. At that spectral range, both the temperature and carrier plasma reflectance coefficients would be of the same (negative) sign leading to a constructive interference between the thermal and carrier plasma wave contributions to the total PMR signal. As a result, the overall PMR signal is expected to increase even more than one would anticipate from the increased thermal component (higher absolute value of  $dR/dT$ ). This UV spectral region could be beneficial for almost all conventional TP applications including those where the signal is dominated by the carrier plasma effects, such as junction depth measurements in implanted and annealed semiconductors.



According to Xitronix, the “underlying reason” the ‘441 Patent specification does not disclose maximizing the entire output signal is because, when it discusses maximizing the signal (in the two passages shown above), it is only referring to the thermal and Drude plasma components of the output signal and not the electro-modulation component. The language of the specification contradicts this reasoning. The specification teaches that “the *overall* PMR signal is expected to increase” and “[t]his increases the *signal* measured by the detector.” The overall PMR signal is understood by the person of ordinary skill in the art to include electro-modulation. Thus, the specification of the ‘441 Patent adequately describes the Asserted Claims.

**D. Claim 7 of the ‘441 Patent is Definite**

*1. Legal Standard for Indefiniteness*

Pursuant to 35 U.S.C. § 112, a claim can be found invalid if it does not “particularly point[] out and distinctly claim[] the subject matter the applicant regards as his invention.” 35 U.S.C. § 112. A claim is invalid for indefiniteness if those skilled in the art would not understand what is claimed. *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2007).

*2. Xitronix Cannot Establish Claim 7 is Indefinite*

Xitronix asserts that claim 7 is indefinite because it covers both an apparatus and a method of use. However, “apparatus claims are not necessarily indefinite for using functional language.” *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008). The use of functional language in a claim can render a claim indefinite when the claim term fails to provide a clear-cut indication of the subject matter covered by the claim. *Id.* The functional language in Claim 7 of the ‘441 Patent does not render the claim indefinite because the covered subject matter is still clearly defined. Like the claim language at issue in *Microprocessor*, Claim 7 is clearly limited to a metrology device possessing the recited structure (i.e., “a detector”) that is capable of performing the recited functions (i.e., “monitoring

modulated changes”). Rather than rendering Claim 7 indefinite, the functional language precisely defines the scope of the claim – much like functional language in a means-plus-function claim element, the use of which is explicitly authorized by statute. *Id.*

## VI. CONCLUSION

KLA-Tencor will prove that Xitronix has infringed the Asserted Claims of the ‘441 Patent, and that the infringement was willful. Xitronix will not be able to prove by clear and convincing evidence that any of the Asserted Claims are invalid.

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Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that on the 29th day of October, 2010, a copy of the foregoing document was served electronically and by operation of the Court's electronic filing system pursuant to Local Rule CV-5(b)(1) to all parties listed below.

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